

What is claimed is:

1. An MRI apparatus comprising:
  - a main magnet (12) for generating a main magnetic field in an examination region;
  - a plurality of gradient magnets (16) for generating magnetic field gradients in the main magnetic field;
  - a radio frequency coil (22) for transmitting radio frequency signals into the examination region and exciting magnetic resonance in a subject disposed therein;
  - a radio frequency coil for receiving the magnetic resonance signals from the subject;
  - a subject support (52) for supporting the subject;
  - a position controller (60) for controlling the position of the subject support within the examination region; and
  - a position sensor (53) for directly measuring the position of the subject support.
2. An MRI apparatus as set forth in claim 1 wherein the position sensor comprises a plurality of graduated scales (57, 58) disposed on at least one of the subject support and a fixed portion with respect to the MRI apparatus and a plurality of read heads (55, 56) disposed on at least one of the subject support and a fixed portion with respect to the MRI apparatus and opposite the graduated scales for reading the graduated scales.
3. An MRI apparatus as set forth in claim 2 wherein the position sensor detects an absolute position of the subject support.
4. An MRI apparatus as set forth in claim 2 wherein the position of the subject support detected by the position sensor is used by the position controller for controlling the position of the subject support.
5. An MRI apparatus as set forth in claim 1 wherein the position sensor comprises:
  - a conductive strip disposed on at least one of the subject support and a fixed portion of the MRI apparatus, the conductive strip having a length and a variable resistance along the length of the strip; and

a contact element disposed on at least one of the subject support and the fixed portion of the MRI apparatus and opposite from the conductive strip, the contact element for making electrical contact with the conductive strip, thereby forming an electrical circuit having an associated current indicative of the position of the subject support.

6. An MRI apparatus as set forth in claim 1 wherein the position sensor comprises:  
a target disposed on the subject support; and  
a laser source disposed in a fixed position relative to the MRI apparatus, the laser source for directing a laser beam at the target and detecting signals reflected thereby to provide an indication of the position of the subject support.
7. An MRI apparatus comprising:  
main field means for generating a main magnetic field in an examination region;  
gradient means for generating magnetic field gradients in the main magnetic field;  
radio frequency transmit means for transmitting radio frequency signals into the examination region and exciting magnetic resonance in a subject disposed therein;  
radio frequency receive means for receiving magnetic resonance signals from the subject;  
subject support means for supporting the subject;  
position control means for controlling the position of the subject support within the examination region; and  
position sensing means for directly measuring the position of the subject support.
8. An MRI apparatus as set forth in claim 8 wherein the position sensing means measures an absolute position of the subject support with respect to a fixed reference frame.
9. An MRI apparatus as set forth in claim 8 wherein the position sensing means comprises a plurality of graduated scales (57, 58) disposed on at least one of the subject support and a fixed portion with respect to the MRI apparatus and a plurality of read heads (55, 56) disposed on at least one of the subject support and a fixed portion with respect to the MRI apparatus and opposite the graduated scales for reading the graduated scales.

10. An MRI apparatus as set forth in claim 7 wherein the position of the subject support measured by the position sensing means is used by the position control means for controlling the position of the subject support.

11. An MRI apparatus as set forth in claim 7 wherein the position sensing means comprises:

a conductive strip disposed on at least one of the subject support and a fixed portion of the MRI apparatus, the conductive strip having a length and a variable resistance along the length of the strip; and

a contact element disposed on at least one of the subject support and the fixed portion of the MRI apparatus and opposite from the conductive strip, the contact element for making electrical contact with the conductive strip, thereby forming an electrical circuit having an associated current indicative of the position of the subject support.

12. An MRI apparatus as set forth in claim 7 wherein the position sensing means comprises:

a target disposed on the subject support; and

a laser source disposed in a fixed position relative to the MRI apparatus, the laser source for directing a laser beam at the target and detecting signals reflected thereby to provide an indication of the position of the subject support.

13. An MRI method comprising the steps of:

generating a main magnetic field in an examination region;

generating magnetic field gradients in the main magnetic field;

transmitting radio frequency signals into the examination region for exciting magnetic resonance in a subject disposed therein;

receiving magnetic resonance signals from the subject;

controlling the position of a subject support within the examination region; and

directly measuring the position of the subject support.

14. An MRI method as set forth in claim 13 wherein the step of directly measuring the position of the subject support includes measuring an absolute position of the subject support with respect to a fixed reference frame.

15. An MRI method as set forth in claim 13 wherein the step of controlling the position of the subject support includes using the direct measurements of the position of the subject support.